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25 **Title: TWO-PIECE SAFETY MECHANISM FOR CEILING FANS**

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BACKGROUND OF THE INVENTION:

Cross Reference to Related Application and Claim to Priority

This application is a continuation-in-part of application Serial No. 10/187,832,
5 filed July 3, 2002, for John C. Marshall, titled "Two-Piece Safety Mechanism for Ceiling Fans," the disclosure of which is incorporated herein by reference and to which priority is claimed pursuant to 35 U.S.C. § 120.

Field of the Invention

10 The present invention relates to a two-piece safety mechanism for use with ceiling fans. A first cable attaches to a ceiling fan, and a second cable attaches to a ceiling support. The first and second cables have first and second connectors, respectively, which releaseably attach to form a continuous cable that retains the ceiling fan in close proximity to a ceiling support if the fan's normal mounting apparatus should fail.

Description of the Prior Art

15 A conventional ceiling fan consists of a motor suspended from a ceiling with radially extending fan blades operably associated with the motor. A cylindrical body, or downrod, is secured to the motor on one end. On the opposing end, the downrod includes
20 a hanger ball. The hanger ball is generally secured to a mounting bracket, and the mounting bracket is secured to a support from a ceiling support. Therefore, the downrod, hanger ball, and mounting bracket work in conjunction to hang the fan from the ceiling support. Electrical wiring from the fan is generally attached to an electrical box in the

ceiling. It is known in the art that such ceiling mounted fans may be subject to falling for various reasons.

A ceiling fan may fall if it is installed improperly. The mounting bracket must be properly secured to the ceiling support. Furthermore, the support must be capable of holding the fan. If not, the fan may fall, damaging the fan or other property, or even causing personal injury. Even if the ceiling support can hold the weight of the fan, the mounting bracket may fail.

In addition, many fans are manufactured with metric bolts, screws or corresponding threads. However, some electrical boxes, especially those manufactured in the United States, have standard threads. When a metric component is fastened to a standard component, a proper fit is not achieved and the attachment may pull free.

Ceiling fans may also fall if faulty or defective materials are used in the fan components. Many mounting brackets manufactured today are largely composed of zinc. When casting zinc brackets, the zinc must not contain impurities. Impurities in a cast zinc mounting bracket may cause brittleness over time and break. Although zinc brackets today may be cast properly, faulty mounting brackets are always a possibility so long as zinc is used in their manufacture.

In addition, ceiling fans are sometimes unbalanced. An unbalanced fan continuously rocks back and forth. The constant, repetitive rocking motion can loosen electrical or mounting connections, cause metal fatigue, and ultimately cause the fan to fall.

To curb the installation of faulty ceiling fans that are prone to falling, and the installation of poorly secured electrical boxes, the National Electrical Code (NEC)

Organization has approved only certain fan and electrical box designs, and mandated that only the approved designs be used on new fan installations. Although this mandate is helpful, it does not entirely prevent the above noted problems. Therefore, there is a need for safety mechanisms that will prevent the fan from falling, and potentially causing
5 personal or property damage.

Various designs in the prior art attempt to solve the above noted problems with ceiling fans, and thereby reduce the possibility that the fan will fall. Some designs require that the mounting bracket be attached to the ceiling support using additional bolts or screws. However, such designs do not allow for easy installation or removal, given
10 additional fasteners must be secured to the ceiling support. Likewise, removal of the fan after it is initially secured is difficult, requiring the removal of the additional fasteners.

Other designs include a single safety cable, which is connected to the fan by one end and to the ceiling support by the opposing end. This design may prevent the fan from falling if the fan mounting should fail, but complicates installation. In order to properly
15 secure a single safety cable to the ceiling support, the fan and mounting bracket must be out of the way. The single cable must first be attached to the fan, and then attached to the ceiling support before the mounting bracket has been secured to the ceiling support (if the mounting bracket is attached beforehand, the single cable may not be properly secured). In the alternative, the single cable could first be attached to the ceiling support. However,
20 the same problems arise. Specifically, the fan would first need to be attached to the mounting bracket, and then the single cable attached to the fan. Thereafter, the fan and mounting bracket would be secured to the ceiling support. Installation of the single safety cable mechanism is therefore inconvenient and difficult.

In addition, many conventional fan designs require partial un-assembly when attaching such a single safety cable mechanism. Thus, installation is further complicated given such un-assembly and subsequent re-assembly would be required when hanging the fan, instead of when the fan is on the floor. Therefore, the single safety cable is not a practical solution. Subsequent removal of the fan, for cleaning, maintenance, replacement, etc., is also complicated when using a single safety cable for similar reasons.

As such, a safety cable mechanism is needed which prevents a ceiling fan from falling, while maintaining simple and efficient installation and subsequent removal procedures. The present invention provides for a two-piece safety mechanism for ceiling mounted fans, which is easy to install and prevents the fan from falling more than a few inches should its normal mounting apparatus fail.

SUMMARY OF THE INVENTION:

A two-piece safety mechanism for ceiling-mounted fans comprises first and second cables. The first cable has a first fastener extending from a first end and a first connector extending from a second end. The first fastener is for operable association with a first fastening mechanism for securing the first cable to a fan. The second cable has a second fastener extending from a first end. The second fastener is for operable association with a second fastening mechanism for securing the second cable to a ceiling support. The second cable also has a second connector extending from a second end. The second connector is releaseably attachable to the first connector, so that the first and second cables may form a continuous cable.

The present invention also relates to a ceiling fan including a two-piece safety mechanism. The ceiling fan with a two-piece safety mechanism comprises a mounting bracket for securing to a ceiling support, a ceiling fan for securing to the mounting bracket, and the two-piece safety mechanism described above. The ceiling fan comprises

5 a motor, a motor housing having a plurality of radially extending fan blades operably associated with the motor, a downrod having a hanger ball for hanging the ceiling fan from the mounting bracket, and electrical wires associated with the motor. The first fastener of the first cable is secured to the fan, and the second fastener from the second cable is secured to the ceiling support. The first and second connectors from the first and

10 second cables may be releaseably attached to form a continuous cable. The continuous cable retains the fan in close proximity to the ceiling support if the mounting bracket fails.

A method of securing a ceiling fan to a ceiling support comprises the following steps: securing a first end of a first cable to a ceiling fan; securing a first end of a second

15 cable to a ceiling support; securing a mounting bracket to the ceiling support; hanging the ceiling fan from the mounting bracket; and connecting a second end of the first cable to a second end of the second cable so that the first and second cables attach to form a continuous cable.

The claimed invention also provides for a mounted ceiling fan comprising a

20 mounting bracket secured to a ceiling support, a downrod having a hanger ball secured to the mounting bracket, a fan secured to the downrod, a first cable secured to the downrod, and a second cable secured to the ceiling support. The first and second cables further include first and second connectors, respectively, which are releaseably attached forming

a continuous cable for retaining the fan in close proximity to the ceiling support should the mounting bracket fail.

In a second embodiment of the present invention, a safety mechanism for ceiling-mounted fans is provided, comprising a cable having a fastener extending from a first end and a connector extending from a second end. The fastener is for operable association with a first fastening mechanism for securing the cable to a fan. A shaped body, preferably L-shaped, is also provided, having a first end and a second end. The first end has a first opening for operable association with a second fastening mechanism for securing the shaped body to a ceiling support. The second end of the shaped body has a second opening configured for receiving the connector for releasably securing the connector therein.

A hanger ball for hanging a ceiling fan from a support comprises a major portion for operable association with a mounting bracket of a ceiling fan. A first cable extends from the major portion. The first cable has a connector extending from a first end; and a second end integrally molded with the major portion. The connector is operably associated with a second cable having a fastener. The connector and fastener are releasably attachable to form a continuous cable. Alternatively, the second end may include a fastener that is secured to the hanger ball using a fastening mechanism.

An electrical box for securing to a support comprises a wall defining an inner chamber for connecting electrical wires therein. A first cable extends from the wall. The first cable has a fastener extending from a first end, and a second end integrally molded with the wall. The fastener is operably associatable with a second cable having a

connector. The fastener and connector are releaseably attachable to form a continuous cable.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an elevational view of a two-piece safety mechanism according to the present invention;

Figure 2 is an elevational view of a continuous cable according to the present invention;

Figure 3 is a fragmentary exploded assembly view of a second connector according to the present invention;

Figure 4 is a fragmentary exploded prospective view of a first connector according to the present invention;

Figure 5 is an assembly view of a ceiling fan with the two-piece safety mechanism and a second installation method for the present invention;

Figure 6 is an exploded assembly view of a ceiling fan with the two-piece safety mechanism and a third installation method for the present invention;

Figure 7 is an exploded view of an L-shaped body according to a second embodiment of the present invention;

Figure 8 is a perspective view of a hanger ball according to a third embodiment of the present invention, with portions molded within the hanger ball shown in phantom;

Figure 9 is a perspective view of an electrical box according to a fourth embodiment of the present invention, with portions molded within the electrical box shown in phantom; and

Figure 10 is a perspective view of a hanger ball according to a fifth embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

5 As best shown in Figure 1, a two-piece safety mechanism 2 for a ceiling mounted fan comprises a first cable C1 and a second cable C2. First cable C1 has a first fastener 4 extending from a first end 6, and a first connector 8 extending from a second end 10. Second cable C2 has a second fastener 12 extending from a first end 14, and a second connector 16 extending from a second end 18. Second connector 16 is operably
10 associated with first connector 8 for releaseably attaching first cable C1 and second cable C2 to form a continuous cable, as best shown in Figure 2. The continuous cable may be easily detached, reforming first cable C1 and second cable C2 by simply disconnecting first connector 8 from second connector 16.

 As best shown in Figure 3, second connector 16 is an elongate body having an
15 opening 20, which is configured to receive first connector 8. Second connector 16 has opposed first and second major surfaces 22 and 24, respectively. Opening 20 extends through major surfaces 22 and 24. A side 26 extends between major surface 22 and major surface 24. First and second slots 28 and 30, respectively, extend through side 26 and into opening 20, and cooperate with cylindrical opening 20 for receiving first
20 connector 8 and second end 10 of first cable C1.

 Side 26 of second connector 16 has a first end 32 and a second end 34, as best shown in Figure 3. Second cable C2 extends from second connector 16 proximate first end 32. Opening 20 is proximate opposing second end 34. First slot 28 extends from

first major surface 22 through side 26 to a point intermediate to second major surface 24. This intermediate point preferably is equidistant from major surfaces 22 and 24. Second slot 30 extends through side 26 to opening 20 intermediate major surfaces 22 and 24, extending from the intermediate point of first slot 28 to second end 34 of side 26. Second slot 30 preferably is perpendicular to first slot 28. Second slot 30 preferably is parallel to major surfaces 22 and 24. In addition, second slot 30 may have ridges 36 for securing first cable C1 and first connector 8.

As best shown in Figure 4, first connector 8 preferably is cylindrical, with flat surfaces 38 and 40. First connector 8 is sized to be received in opening 20 of second connector 16. First connector 8 is received in opening 20 so that second end 10 of first cable C1 may be aligned with first slot 28, as best shown in Figure 3. First connector 8 is inserted into opening 20. Second end 10 of first cable C1 is aligned with, and inserted into, slot 28. Flat surfaces 38 and 40 may be flush with major surfaces 22 and 24 after insertion of first connector 8 into opening 20. First connector 8, along with second end 10 of first cable C1, is moved into second slot 30 by swiveling first connector 8 within opening 20. Second end 10 of first cable C1 thereafter moves into second slot 30 and past ridges 36, so that first cable C1 extends from slot 30 proximate second end 34 of second connector 16. First and second slots 28 and 30, along with ridges 36 cooperate to releaseably attach first and second cables C1 and C2, thereby forming a continuous cable. The first and second connectors may be made of zinc, or other suitable materials.

In a preferred embodiment of the present invention, two-piece safety mechanism 2 is operably associated with a ceiling fan. Mounting components for a ceiling fan with safety mechanism 2 are best shown in Figure 5. Generally, a ceiling fan includes a fan

motor 50, which is attached to a downrod 52. Downrod 52 includes a hanger ball 54, which is operably associated with a mounting bracket 56 for hanging the ceiling fan from ceiling support S. Hanger ball 54 fits into a corresponding portion B of mounting bracket 56. Mounting bracket 56 is secured to ceiling support S with a plurality of mounting screws 58. A canopy 60 may cover hanger ball 54 and mounting bracket 56 for aesthetic purposes, and is secured to mounting bracket 56 using canopy screws 62. These components of the ceiling fan are well known in the art.

First cable C1 may be secured to downrod 52 above hanger ball 54, as shown in Figure 5. Downrod 52 includes a corresponding opening O in which first fastener 4 may be secured using first fastening mechanism 64. First fastener 4 includes an opening 66 through which first fastening mechanism 64 passes, as best shown in Figure 2. First fastening mechanism 64 may then be secured in corresponding opening O of downrod 52, thereby securing first cable C1, as shown in Figure 5. In the preferred embodiment, first fastening mechanism 64 is a pin. However, any known fastening mechanism may be used, such as a bolt or a screw. First cable C1 is preferably secured to the ceiling fan before the fan is being secured to mounting bracket 56.

As best shown in Figure 2, second cable C2 may be secured to the ceiling support S, before mounting bracket 56 is secured to the ceiling support S. Second fastener 12 is secured to ceiling support S using a second fastening mechanism 68. Second fastening mechanism 68 may also include any known fastening mechanism, but is preferably a screw or bolt. Second fastener 12 also includes an opening 70, operably associated with second fastening mechanism 68.

It should be understood, however, that first cable C1 may be also be secured to the ceiling support S. First fastener 4 may be secured to ceiling support S using second fastening mechanism 68. Likewise, second fastener 12 of second cable C2 may be secured in opening O of downrod 52 using first fastening mechanism 64. In this way,
5 first cable C1 and second cable C2 are interchangeable.

In a preferred installation of a ceiling fan having two-piece safety mechanism 2, second fastener 12 is secured directly to ceiling support S using second fastening mechanism 68, as best shown in Figure 2. Then, mounting bracket 56 may be secured to ceiling support S proximate secured second fastener 12 using mounting screws 58.
10 Having already secured first fastener 4 to the ceiling fan as explained above, the ceiling fan may then be secured to mounting bracket 56 with corresponding hanger ball 54 on downrod 52. First connector 8 may then be releaseably secured to second connector 16, as explained above, along with the associated electrical wiring for the ceiling fan.

First connector 8 and second connector 16 may be easily joined together to form a
15 continuous cable. The continuous cable retains the fan in close proximity to ceiling support S if mounting bracket 56 should fail. First connector 8 and second connector 16 fit securely together, with ridges 36 securing first end 6 of first cable C1 within second slot 30, so that vibrations from operation of a fixture do not cause first and second connectors 8 and 16 to detach.

20 A second installation for the claimed invention is best shown in Figure 5, which depicts various mounting components for a ceiling fan, described above. Hanger ball 54 is operably associated with mounting bracket 56, so that hanger ball 54 fits in corresponding portion B of mounting bracket 56. Mounting bracket 56 is first secured to

ceiling support S using mounting screws 58. One of the plurality of mounting screws 58 is used to secure second fastener 12. As best shown in Figure 5, one of the mounting screws 58 is passed through opening 70 of second fastener 12, through the respective area in mounting bracket 56, and into ceiling support S. Thus, one of the mounting screws 58 functions as second fastening mechanism 68. First fastener 4 of cable C1 is secured to the ceiling fan as explained above.

A third method of installation of the claimed invention is best shown in Figure 6. Again, first fastener 4 of cable C1 is secured to the ceiling fan as explained above. However, second cable C2 is secured to an electrical box E prior to securing mounting bracket 56 to ceiling support S, as shown in Figure 6. Generally, electrical box E is secured to ceiling support S by a plurality of electrical box fasteners 72, such as screws or bolts. One of the electrical box fasteners 72 may be used as second fastening mechanism 68, as shown in Figure 6, wherein second fastener 12 is secured to electrical box E using one of electrical box fasteners 72, which in turn is fastened into ceiling support S. This method of installation may be desirable when an NEC approved electrical box is mounted in ceiling support S.

The two-piece safety mechanism of the present invention makes installation on ceiling fans very simple. First cable C1 is attached to the ceiling fan when it is being assembled on the floor. Second cable C2 is attached to the ceiling support (or electrical box) before the fan is hung from mounting bracket 56. After installing the fan, cables C1 and C2 may be easily joined together using the specially designed first and second connectors, 8 and 16. In addition, if the fan ever requires servicing, cleaning, replacing

fan parts, etc., cables C1 and C2 may be easily detached. The two cables are simply disconnected after other disconnections have been made.

A second embodiment of the invention is best shown in Figure 7, wherein second cable C2 has been modified, and the intermediate cable between second fastener 12 and second connector 16 has been eliminated. As shown in Figure 7, second fastener 12a and second connector 16a are molded as a single shaped body C3, preferably L-shaped, though shaped body C3 need not be at a right angle. Shaped body C3 includes elements corresponding to second fastener 12 and second connector 16, which have been explained above, and correspondingly numbered. Second fastener 12a includes an opening 70, which is operably associated with second fastening mechanism 68. Shaped body C3 is secured to ceiling support S using second fastening mechanism 68, as explained above. Second connector 16a is operably associated with first connector 8 as explained above, and includes all corresponding elements, as shown in Figure 7. Shaped body C3 therefore has corresponding openings 70 and 20, which are preferably perpendicular to each other. Slots 28 and 30 are operably associated with opening 20, and slot 30 is preferably parallel with opening 20, and contains ridges 36 as described above. However, it should be understood that shaped body C3 may also be secured in opening O of downrod 52 using first fastening mechanism 64.

In a third embodiment, the first cable and hanger ball have been integrated into a single unit. As best shown in Figure 8, hanger ball 80 includes a first cable C1' extending from an upper surface 82. First cable C1' is preferably molded into hanger ball 80 at the time of manufacture. Aside from the integration of first cable C1' into hanger ball 80, hanger ball 80 has a configuration similar to hanger ball 54. Therefore, hanger ball 80 is

operably associated with mounting bracket 56, so that hanger ball 80 fits in corresponding portion B of mounting bracket 56, as best shown in Figure 6. In addition, hanger ball 80 is operably associated with downrod 52. Hanger ball 80 may have a smooth channel for receiving downrod 52, which may be secured therein with screws, pins, or the like as known in the art. Alternatively, hanger ball 80 may have a threaded channel 84, as best shown in Figure 8, for threadably receiving a downrod.

First cable C1' is not separately secured to downrod 52, because first end 6' is secured directly to upper surface 82 of hanger ball 80. Preferably, first cable C1' includes a portion 84 extending from first end 6' that is molded within hanger ball 80. First cable C1' also includes a first connector 8 extending from second end 10. As such, first connector 8 is operably associated with second connector 16 of second cable C2 for releaseably attaching first cable C1' and second cable C2 to form a continuous cable, as described above.

Installation of the third embodiment of the present invention on ceiling fans is simplified given first cable C1' need not be separately secured to downrod 52. Second cable C2 is attached to the ceiling support (or electrical box) before the fan is hung from mounting bracket 56. After installing the fan and securing hanger ball 80 to mounting bracket 56, cables C1' and C2 are easily joined together as described above.

Alternatively, second cable C2 and electrical box E may be integrated into a single unit. As best shown in Figure 9, a fourth embodiment of the present invention provides an electrical box 90 having a second cable C2' extending from side surface 92. Second cable C2' is preferably molded into electrical box 90 at the time of manufacture. Alternatively, second cable C2' may be secured to side surface 92 using screws, bolts,

pins or the like prior to installation of electrical box 90. Thus, electrical box 90 may be provided to a user having second cable C2' already secured thereto. Electrical box 90 may be manufactured from sheet metal, plastic or any other approved material.

Installation of the safety mechanism according to the fourth embodiment is
5 streamlined because the user is not required to secure second cable C2' to an electrical box, given it is already incorporated into electrical box 90. Second cable C2' preferably includes a portion 94 extending from first end 14' that is molded within electrical box 90. Second cable C2' includes a second connector 16 extending from a second end 18. As
10 such, second connector 16 is operably associated with first connector 8 of first cable C1 for releaseably attaching second cable C2' and first cable C1 to form a continuous cable, as described above.

Preferably, electrical box 90 is provided with first cable C1, so that the installer has all of the necessary components for installation of the safety mechanism of the present invention when electrical box 90 is initially installed. Electrical box 90 may be
15 secured to ceiling support S using a plurality of electrical box fasteners 72, as best shown in Figure 6.

In a fifth embodiment, cable C1 may be secured directly to a hanger ball 100 with a fastening mechanism 102, as best shown in Figure 10. Hanger ball 100 includes a corresponding opening O' in which fastener 4 of cable C1 may be secured using fastening
20 mechanism 102. Fastening mechanism 102 is passed into opening O', through fastener 4, and into a receiving portion 104, thereby securing first cable C1 to hanger ball 100.

Fastening mechanism 102 is preferably a screw, but may be a bolt, a pin, or the like.

Opening O' is preferably a recessed opening, which allows fastening mechanism 102 to

be recessed from an outer surface 106 of hanger ball 100. Preferably, fastening mechanism is a stainless steel screw, which is screwed into opening O' so that the head of the screw does not extend outwardly from outer surface 106. Hanger ball 100 may include supports 108, 109, such as metal plates, which include openings corresponding to and aligned with opening O' and receiving portion 104. Adequate space is provided between supports 108, 109 to allow fastener 4 of cable C1 to be secured therebetween. Thus, fastening mechanism 102 may be screwed into opening O', through support 108, through the opening of fastener 4 (as best shown in Figure 2), and into receiving portion 104 of support 109.

Second cable C2 may be secured to support S or electrical box E, as described above. Cables C1 and C2 are then releasably attached. Alternatively, cable C1 may be secured to second cable C2' of electrical box 90.

It will be apparent to one of ordinary skill in the art that various modifications and variations can be made in construction or configuration of the present invention without departing from the scope or spirit of the invention. Thus, it is intended that the present invention cover the modifications and variations of the invention, provided they come within the scope of the following claims and their equivalents.